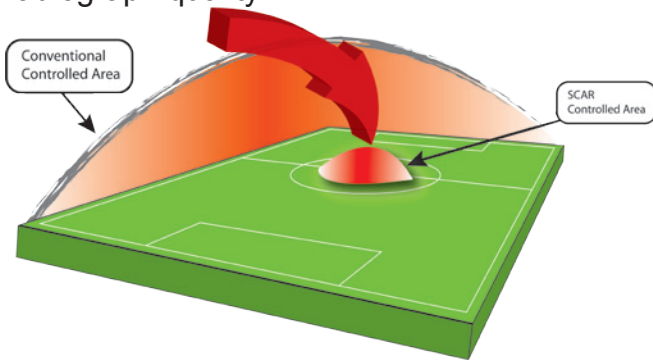


THE SCAR SYSTEM

The SCAR (Small Controlled Area Radiography) and “Baby” SCAR are systems unique to Oceaneering Asset Integrity. Developed with Safety as the main objective, they enable radiography to be carried out with radiation levels ALARP (As Low As Reasonably Practicable). The SCAR family has quite simply set a precedent for safer working in the industry that others aspire to follow.

The systems are capable of performing radiography inside a controlled area erected in the heart of the workplace, without disruption to normal operations. The reduction of unwanted radiation scattering effects around the film by effective photoelectric absorption has an additional benefit of improving radiograph quality.



Resultant Safety Advantages

- No overdose from radiation incident emergencies
- Reduced radiation doses
- Simple recovery procedure with zero risk of source detachment
- Requires mandatory pre-planning of the work
- A small controlled area means positive, direct and easy control
- Minimum interference with emergency escape routes
- Open display of radiography operations
- Minimizes operator error

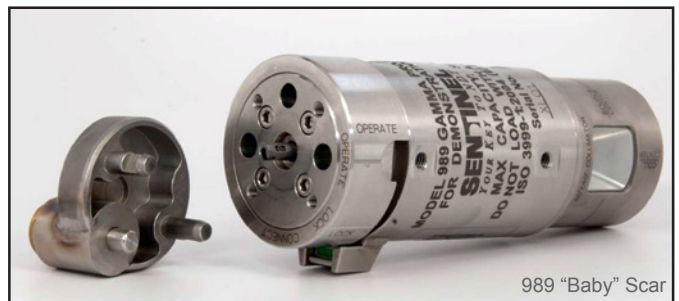
Engineered Safety Features – 959(M) SCAR

- Failsafe spring retraction mechanism
- Automatic timer and exposure shut-off mechanism
- Source is an integral part of a tungsten rod that cannot detach
- 150mm integral emergency retraction rod - no need for separate emergency kit
- Direct physical access to the source is impossible
- Beam limited to one direction



Engineered Safety Features – 989 “Baby” SCAR

- Posilock safety locking mechanism
- Only 1/3rd turn hand crank operation
- Direct physical access to the source is impossible
- Beam limited to one direction
- Lightweight tungsten and lead shield



THE SCAR SYSTEM



Design

The Oceaneering SCAR system is undoubtedly the safest gamma radiographic system in the world comprising an internationally certified, purpose built, ISO 3999 Category X gamma radiation source camera, rated to carry 555 GBq (15 curies) of Iridium 192 or up to 3 TBq (80 curies) of Selenium 75. The improved shielding and beam collimation provided by the Sentinel model 959(M) gamma camera allows the source exposures to be done more simply to the required standard of radiation protection. The camera is pneumatically actuated from a remote distance, has a “fail-safe” built in safety feature and automatically terminates exposures from a unique timer on the control box.

The “Baby SCAR” was inspired by its bigger relation and provides the same ultra-safe, non-projection feature as the original. The model 989 is fully ISO 3999 approved as category ‘X’ and Type ‘A’ package, rated to carry a 740 GBq (20 Curie) Selenium 75 payload. It has a Tungsten primary shield with a 40° square directional beamport and only weighs 7.5kg meaning it is incredibly easy to position using the Oceaneering purpose built clamping mechanism. Simple actuation pushes the isotope from the stored position to the open position using a conventional Sentinel Teleflex cable mechanism, using only a third turn on the handle to expose and retract, with a “posilok” safety locking mechanism.

Purpose built accessories are essential to the effective operation of the overall systems and are custom engineered by the company to fit most joint geometries. Correct application of the systems will reduce the Controlled Area to typically within 3 metres of the emission point.

The advantages for safer working are self-evident; the systems additionally offer improved radiographic image quality and the potential for substantial cost savings.

Cost Savings

- Minimal disruption to adjacent operations
- Improved productivity from 24 hour Radiography - minimising delays on commissioning activities
- No risk of radiation incident therefore no risk of incident costs
- Minimal interference with Nucleonic Level Gauges, therefore no unscheduled plant shutdown costs
- HOIS recommended technique for fast screening of complex geometry smallbore piping for corrosion and erosion minimising hydrocarbon releases
- Inspection through insulation for corrosion - no need for insulation removal
- Helps meet target dates and proven to help reduce shutdown durations
- No downtime for any trades
- More production time for all trades

Summary

- SCAR is safe to use 24 hours a day - no need for specific radiography windows
- Cost efficient
- The barriered area is always very small, normally less than 10 m diameter
- The area is easy to see and control
- SCAR will not normally affect other work
- The equipment fits most pipe geometries
- SCAR can replace most conventional radiography when planned in advance

